

ABSTRACT

A power conversion module comprises a stack-piezo disposed in a housing between a mechanical stop and a moveable piston adjacent a sealed chamber containing a fluid. The mechanical stop biases the stack-piezo expansion direction. An energized stack-piezo expands and moves the piston, which in turn applies compressive force to the fluid in the sealed chamber. The forces applied to the fluid displaces a shaft slidably mounted in a channel formed in the chamber. A biasing means returns the shaft to its starting position when the piezo is de-energized. The sealed chamber preferably has a large diameter adjacent the piston, and a smaller diameter opening for the channel, through which the shaft moves. Preferably, the sealed chamber mostly has a frustoconical shape. The shaft deflection distance may be varied by altering the ratio of the fluid-exposed surface area of the piston to that of the shaft and altering the stack-piezo's length.